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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/549,696	09/19/2005	Junji Takenaka	1691-0209PUS1	9538
2292 7590 09/07/2007 BIRCH STEWART KOLASCH & BIRCH PO BOX 747 FALLS CHURCH, VA 22040-0747			EXAMINER FREEMAN, JOHN D	
			ART UNIT 1709	PAPER NUMBER
			NOTIFICATION DATE 09/07/2007	DELIVERY MODE ELECTRONIC

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

mailroom@bskb.com

<b>Office Action Summary</b>	Application No. 10/549,696	Applicant(s) TAKENAKA ET AL.	
	Examiner John Freeman	Art Unit 1709	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1,2 and 4-14 is/are pending in the application.  
     4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,2 and 4-14 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
     Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
     Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
     a) ☒ All    b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date <u>9/05, 12/05, 4/06, 11/06</u> . | 6) <input type="checkbox"/> Other: ____.  |

## DETAILED ACTION

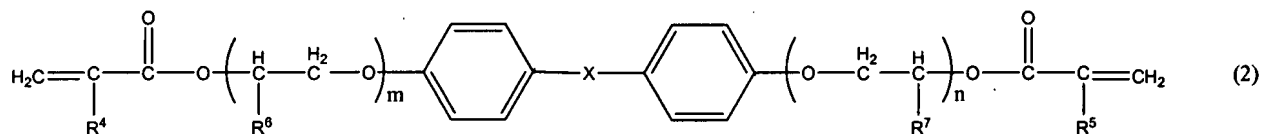
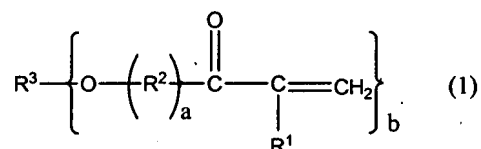
### *Specification*

1. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

### *Double Patenting*

2. Claims 6, 9 and 10 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1 and 2 of U.S. Patent No. 6,802,993. Although the conflicting claims are not identical, they are not patentably distinct from each other.

3. Claims 6, 9 and 10 are directed to curable compositions comprising (I) a monomer represented by formula (1), (II) a monomer represented by formula (2), (III) a polymerizable monomer other than (1) or (2), (IV) any photochromic compound, and (V) polymerization initiators:



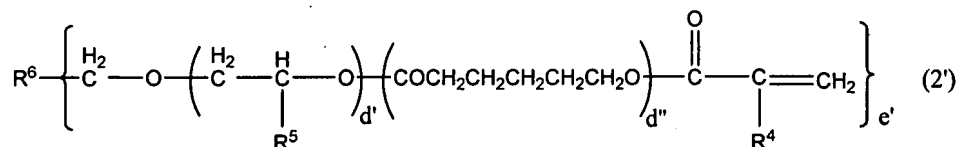
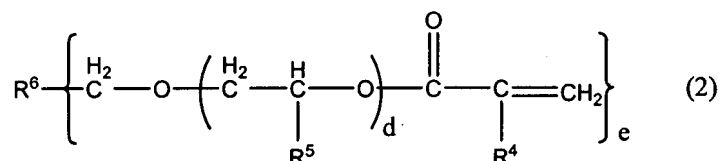
4. Specific embodiments of these formulae result in compositions that overlap with U.S. 6,802,993.

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5. The polymerization initiators are either thermal (claim 6) or photo-induced (9, 10).

The examiner interprets these as being functional equivalents for the purpose of starting a polymerization process.

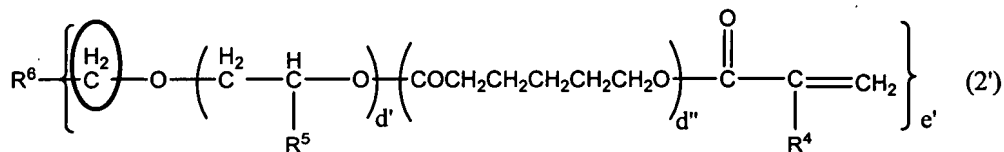
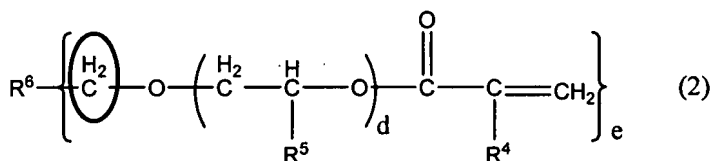
6. In U.S. 6,802,993, Momoda et al. claim a curable composition comprising (A) a polymerizable monomer following formula (2) or (2'), (B) a polymerizable monomer having a silanol group, (C) another polymerizable monomer different from (A) or (B), and (D) a photochromic compound:



7. Compound (I) is equivalent to compound (A) in claim 1 of 6,802,993:

a. When R<sub>4</sub> of (A) is a hydrogen atom, or methyl group, it is the same as R<sub>1</sub> of (I).

b. The circled CH<sub>2</sub> of (2) and (2') of (A) below are considered to be a part of R<sub>3</sub> in compound (I).



- c. R2 of (I) can be  $-\text{CH}_2\text{CH}_2\text{O}-$ , or  $-\text{CH}_2\text{CH}(\text{CH}_3)\text{O}-$  making it equal to the 'd-bracket' of (A) if R5 is a hydrogen or a methyl group respectively.
  - d. R2 of (I) can be  $-\text{C}(=\text{O})\text{CH}_2\text{CH}_2\text{CH}_2\text{CH}_2\text{CH}_2\text{O}-$  making it equal to the 'd-bracket' of (A) if  $d'=0$ .
  - e. The integer b of (I) equals the integers e and e' of (A).
  - f. The integer a of (I) equals the integers d and d'' of (A).
8. Compound (II) is equivalent to compound (C) of 6,802,993; (II) is a polymerizable monomer different from (A) and (B).
  9. Compound (III) is equivalent to compound (B) of 6,802,993. Compound (III) is defined as a polymerizable monomer different than monomers (I) and (II). A polymerizable monomer having a silanol group (C) is different from (I) and (II).
  10. The following table highlights the overlap of weight percentages of the compounds in their respective compositions.

	(I)	(A)	(II)	(C)	(III)	(B)
<b>Claim 1*</b>	-	1-50%	-	30-98.5%	-	0.5-20%
<b>6</b>	1-15%	-	10-80%	-	5-89%	-
<b>9</b>	1-60	-	10-90	-	0-89	-
<b>10</b>	10-60	-	20-90	-	0-70	-

\*=Claim in U.S. 6,802,993; all others are in 10/549696

11. Claim 2 of U.S. 6,802,993 further limits claim 1 by providing a more specific embodiment for compound (B). The limitation still overlaps with compound (III).

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12. The amount of polymerization initiator used in claims 6, 9 and 10 is not specified.

The examiner thus considers that Applicant claims any amount may be used, including that which is specified in U.S. 6,802,993.

***Claim Rejections - 35 USC § 102***

13. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

14. Claims 5-7, 9 and 10 are rejected under 35 U.S.C. 102(b) as being anticipated by Momoda et al. EP 1130038.

15. Momoda et al. (EP 1130038) disclose a curable composition comprising (A) a polymerizable monomer, (B) a polyfunctional polymerizable monomer, (C) a difunctional polymerizable monomer, and (D) a photochromic compound.

16. Component (A) is considered to be Applicants' component (III). Specific embodiments include polyethylene glycol methacrylate and methyl ether polyethylene glycol methacrylate [0037].

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17. Component (B) is Applicants' component (I) [0050, formula (4)]. Specific embodiments include trimethylolpropane trimethacrylate and trimethylolpropane triacrylate [0052].

18. Component (C) is Applicants' component (II) [0057, formula (5)]. Specific embodiments include diethylene glycol dimethacrylate and triethylene glycol dimethacrylate [0062].

19. Momoda et al. disclose the weights of (B) and (C) together, i.e. "...[(B) and (C)] are used in amounts of from 50 to 99% by mass...based on the total mass of the monomers..." [0069]. They then disclose the individual monomer weights in terms of the sum of both monomers: (B) is 2 to 50% by mass based on the sum of weights of (B) and (C), while (C) is 50-98% by mass based on the same sum. The following example shows how the weights overlap with those claimed by Applicants. If (B) and (C) combine to make 50% of the total weight of all monomers, and (B) constitutes 20% by weight of the sum of (B) and (C), and (C) constitutes 80% by weight of the same sum, then component (B) constitutes 10% of the total weight of all monomers and (C) constitutes 40% of the total weight.

20. Component (D), like component (IV), is a photochromic compound, e.g. fulgimide and spirooxazine compounds [0081]. Polymerization initiators such as benzoyl peroxide [0098] and benzoin [0102] can be used in the composition as in the case of component (V).

21. With regard to the bifunctional to hexafunctional urethane oligomers or bifunctional to hexafunctional polyester oligomers of Claim 5, Momoda et al disclose the

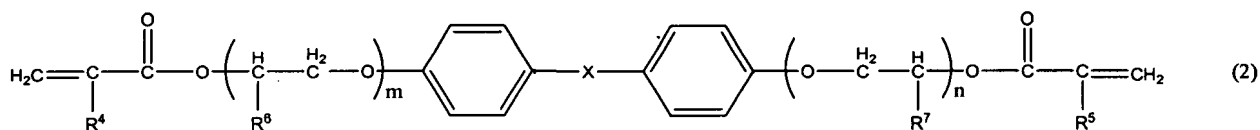
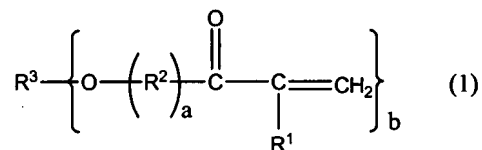
use of triurethaneoligomer tetraacrylate and urethaneoligomer hexamethacrylate [0052].

This is another example of component (B). It can, however, be used with the other examples of (B): trimethylolpropane trimethacrylate and urethaneoligomer hexamethacrylate can be used together [0052, ln. 10].

22. Claims 6, 9 and 10 rejected under 35 U.S.C. 102(e) as being anticipated by Momoda et al. (U.S. 6,802,993).

23. The applied reference has a common inventor and assignee with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 102(e) might be overcome either by a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not the invention "by another," or by an appropriate showing under 37 CFR 1.131.

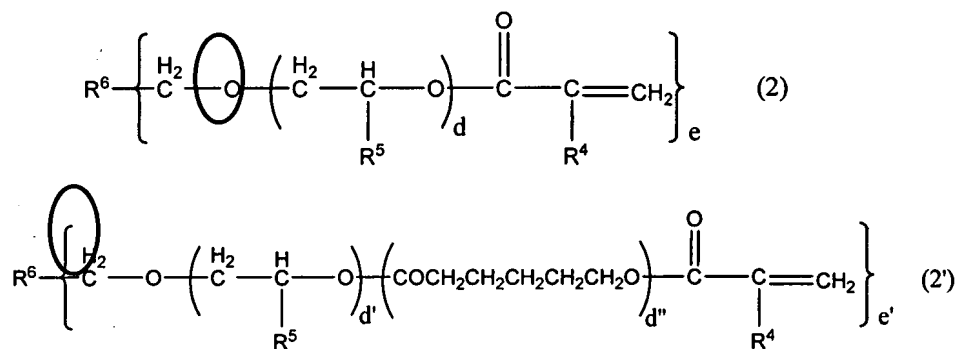
24. Claims 6, 9 and 10 are directed to curable compositions comprising (I) a monomer represented by formula (1), (II) a monomer represented by formula (2), (III) a polymerizable monomer other than (1) or (2), (IV) any photochromic compound, and (V) polymerization initiators:



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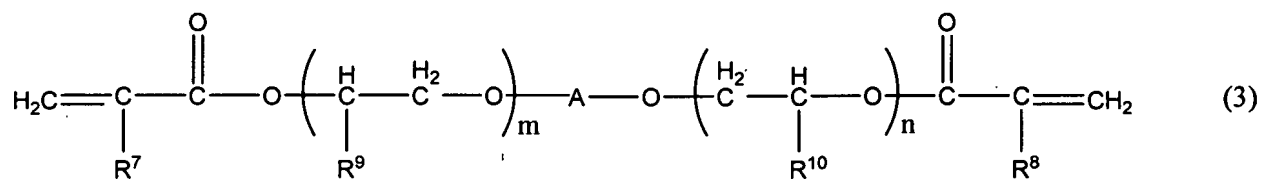
25. Momoda et al. teach a curable composition comprising components (A), (B), (C), and (D).

26. Component (A) is represented by the formulae (2) and (2') (col. 3 ln 25+):

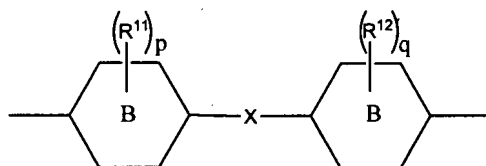


27. Monomer (I) is substantially the same as component (A) as explained in paragraph 7 above.

28. Momoda et al. disclose a preferred embodiment of component (C) in the form of formula (3) (col. 7 ln. 11+):



29. Wherein A can be represented by (col. 7 ln. 35+):



30. Note that the rings, B, are benzene rings, p and q can be equal to zero and X can be  $-\text{O}-$ ,  $-\text{S}-$ ,  $-\text{S}(=\text{O})_2-$ ,  $-\text{CH}_2-$ , etc. as claimed by Applicant as component (II) (col. 7

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In. 50). The examiner also draws attention to the parentheses represented by 'n' in both Applicants' disclosure and that of Momoda et al. In Applicants' claims, the oxygen closest to the phenyl rings is contained within the parentheses, while in 6,802,993 the parentheses are shifted over so as to not include the oxygen closest to the rings, but rather include the oxygen closest to the carbonyl. This minor change does not result in a different final product; the positions of the oxygen atoms are the same in the both repeating units.

31. Momoda et al. also disclose the use of a silyl monomer component (B) (col. 4 In. 18-29). This corresponds to Applicants' component (III). Component (D) of Momoda et al. is a photochromic compound such as fulgimide compounds, spirooxazine compounds, etc. (col. 11 In. 66+), corresponding to component (IV). Momoda et al. also teach the use of thermopolymerization initiators such as benzoyl peroxide (col. 19 In. 18-29) and photopolymerization initiators such as benzoin (col. 19 In 50-61).

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32. Components (A), (B) and (C) are disclosed with the following weight percentages: (See (A) col. 4 ln. 6-17, (B) col. 6 ln.58-61, and (C) col. 6 ln. 20-33.)

(A)	(B)	(C)
1-50%	0.5-20%	30-98.5%
2-40	1-10	50-97
2-30	2-10	60-96

***Claim Rejections - 35 USC § 103***

33. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

34. Claims 1 and 4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Momoda et al. (EP 1130038).

35. Claims 1 and 4 are directed to cured compositions (substrates) comprising (I) a monomer represented by formula (1), (II) a monomer represented by formula (2), (III) a polymerizable monomer other than (1) or (2), (IV) any photochromic compound, and (V) polymerization initiators. (See paragraph 17 of this Office Action for formulae (1) and (2).)

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36. The tensile strength of said cured compositions is equal to or greater than 20kg-f.

The half-life period of (IV) in the cured product is less than or equal to thirty times the half-life period of (IV) in the composition before curing.

37. Momoda et al. disclose a cured product containing (I), (II), (III), (IV) and (V) as discussed in paragraphs 28-33 of this Office Action.

38. The claimed tensile strength of 20kg-f or greater would have been an obvious variation of the cured composition to one of ordinary skill in the art. Lenses must be able to resist impacts and drilling in order to be of use. As such, one of ordinary skill would recognize the necessity of creating a lens that can withstand a baseline amount of abuse. Thus, one could reasonably experiment with the conditions of the invention to arrive at the given tensile strength.

39. The half-life period of photochromic compounds (IV) is known to decrease upon transitioning from a polymerizable solution to a polymerized product [0004]. As such, Applicants' claimed value of an increase of no more than thirty times for the polymerized substrate confers no special limitation to the product. Furthermore, as the composition disclosed by Momoda et al. could be the same composition as disclosed by Applicants, there is the reasonable expectation that one could arrive at such a property without undue experimentation.

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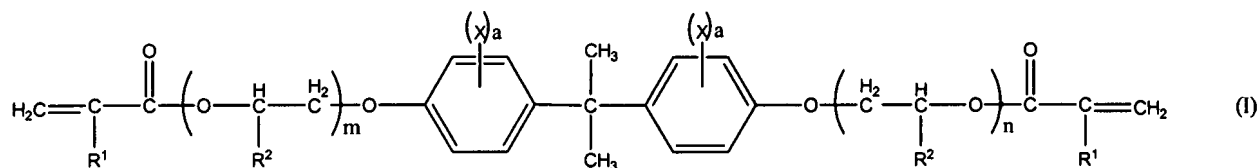
40. Claims 2, 8, 11 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Momoda et al. (EP 1130038) in view of Imura et al. (U.S. 5,556,931).

41. Each claim presents a further limitation of an independent claim. Specifically, each claim further limits component (II) such that it is composed of two compounds each according to formula (2). Type one has a sum of  $(m+n)=0$  to 5. Type two has a sum of  $(m+n)=6$  to 30. Type two is present in a molar amount of no more than three times as much as type one.

42. Momoda et al. discloses the cured compositions of the parent claims as previously described.

43. While Momoda et al. disclose a value of  $(m+n)=2$  to 6 on average, they are silent with regard to higher  $(m+n)$  values [0057 p10 ln. 12].

44. Imura et al. disclose the following formula (I) for use in a lens substrate:



45. As the integer  $a$  can equal zero, this is the same as Applicants' formula (2) (col. 3 ln. 1+).

46. Imura et al. disclose that each of  $m$  and  $n$  can be an integer from 1 to 15 (col. 3 ln. 55). They further teach that compounds with values of  $(m+n)=2$  to 3 are very hard (col. 5 ln. 2), while those with values of  $(m+n)=6-12$  are less hard, but better resist impacts (col. 5 ln. 24-29). Values over 12 result in even softer compounds (col. 5 ln. 29-32).

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47. At the time of the invention, it would have been obvious to one of ordinary skill in the art to mix the hard and soft monomers in various ratios until a product with desired hardness, tensile strength and impact resistance was produced.

48. Claims 12 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Momoda et al. (EP 1130038) in view of Geffcken et al. (U.S. 3,713,869).

49. Claims 12 and 14 are toward the cured compositions of claims 1 and 4 respectively, wherein the substrates have a hard coat layer and a buffer layer. The buffer layer is located between the substrate and the hard coat layer, and has a lower pencil hardness than the hard coat layer.

50. Momoda et al. teach the use of a hard coating agent to create a thin film on the cured product [0103] as in claims 12 and 14. They are silent, however, with regard to the use of a buffer layer interposed between the substrate and the hard coating layer.

51. Geffcken et al. disclose the use of an intermediate layer between a hard inorganic layer and a plastic substrate (col. 2 ln. 56+). The intermediate or primer layer improves the adhesion of hard layer to the plastic substrate.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to John Freeman whose telephone number is 571-270-3469. The examiner can normally be reached on Monday-Friday 7:30-5:00PM EST (First Friday off).

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, D. Lawrence Tarazano can be reached on 571-272-1515. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

**D. LAWRENCE TARAZANO**  
**PRIMARY EXAMINER**

A large, stylized handwritten signature in black ink, appearing to read 'D. Tarazano', is written over the printed name and title.

John Freeman  
Examiner  
Art Unit 1709